



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/816,190	04/02/2004	Steven George Hansen	081468-0309021	7518

909 7590 06/30/2006

PILLSBURY WINTHROP SHAW PITTMAN, LLP
P.O. BOX 10500
MCLEAN, VA 22102

EXAMINER

GUTIERREZ, KEVIN C

ART UNIT	PAPER NUMBER
----------	--------------

2851

DATE MAILED: 06/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/816,190	Applicant(s) HANSEN ET AL.	
	Examiner Kevin Gutierrez	Art Unit 2851	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 June 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 4-8 and 11-13 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 9, 10 and 14-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 April 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

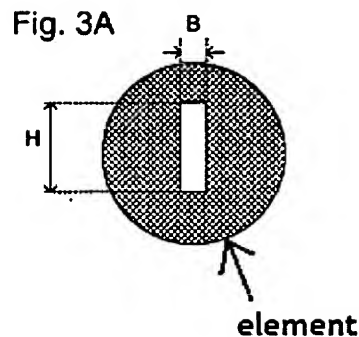
DETAILED ACTION

Response to Arguments

1. Applicant's arguments, see Remarks, filed June 13, 2006, with respect to the objection(s) and rejection(s) of claim(s) 1-3, 9-10 and 14-20 under 35 USC 102 and 103 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, the objection to the Drawings is maintained because the Applicant states the Examiner has not specifically pointed out any claim elements. The image of the referenced element is provided below. Further, the element does not contain a reference value. Appropriate correction is required.

Drawings

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the location of the claimed element shown in Figure 3A (the *element*, as labeled by the Examiner in the image provided below, which is further not provided with a reference number) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.



Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-3, 9-10, 14 and 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Orino (US 2003/0020892) in view of Inoue et al. (5,673,103).

Regarding claims 1 and 18-19, Orino discloses

- “an illumination system (fig. 1, 100; illumination apparatus) for providing a projection beam of radiation;
- a support structure ([0048], line 1) for supporting patterning structure (200; mask), the patterning structure serving to impart the projection beam with a pattern in its cross-section;
- a substrate table ([0051], line 1) for holding a substrate (W);
- a projection system (300) for projecting the patterned beam onto a target portion of the substrate (W);
- at least one pupil shaping element (160; masking blade) constructed and arranged to define an on-axis ([0041], lines 3-6), substantially rectilinear intensity distribution on the projection beam at a pupil plane of the illumination system (see fig. 1, where 160 is at the pupil plane (denoted by the crossing of solid lines within 160).”

Orino does not disclose “a polarizer, constructed and arranged to impart a linear polarization to the projection beam.”

However, Orino suggests the use of polarization beams [0031], lines 7-9) and having “a polarizer, constructed and arranged to impart a linear polarization to the projection beam” is known to the art as it is evident by the teaching of Inoue et al. (See, where 1 is a polarizer; col. 7, lines 35-36). Thus, it would have been obvious to one ordinary skilled in the art at the time the invention was made to modify the illumination system of Orino by including a polarizer to obtain a substantially higher intensity beam.

Regarding claim 2, Orino further discloses “wherein said intensity distribution is a rectangle having an aspect ratio not equal to 1, and the longer dimension of the rectangle is parallel to the X or Y axis of the apparatus ([0041], lines 3-6, where the movable blades are variable to adjust the size of the rectangular aperture).”

Regarding claim 3, Inoue et al. further disclose “wherein said linear polarization is substantially parallel to the longer dimension of the rectangle (col 7, lines 62-65).”

Regarding claim 9, Orino “wherein the center of said intensity distribution (see fig. 1, where the radiation beam denoted solid and dashed lines are centered around the optical axis OA) lies on the optical axis (OA) of the illumination system (100).”

Regarding claim 10, Orino discloses a mask, but does not disclose “further comprising a phase-shift mask as said patterning structure.”

However, having “phase-shift mask as said patterning structure” is known to the art as it is evident by the teaching of Inoue et al. (col. 7, lines 41-43, where a phase shift mask can be used instead of a photomask).” Thus, it would have been obvious to one ordinary skilled in the art at the time the invention was made to modify the patterning structure of Orino by using a phase shift mask for at least the purpose of controlling the polarization characteristics of the projected beam.

Regarding claim 14, Orino further discloses “wherein said at least one optical element comprises a set of moveable blades ([0041], lines 3-5).”

Regarding claim 17, Inoue et al. further disclose “wherein said polarize comprises a radiation source that emits a linearly polarized beam. (col. 8, lines 16-18). ”

Regarding claim 20, Inoue et al. further disclose “wherein in said linearly polarizing, the direction of the linear polarization imparted to the beam is substantially parallel to lines of said pattern (col. 7, lines 62-65).”

5. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Orino in view of Inoue et al., as applied to claims 1-3, 9-10, 14 and 17-20 above, and in further view of Nishi (6,608,665).

Orino as modified discloses with an aperture corresponding to said intensity distribution. Orino as modified not disclose wherein said at least one optical element comprises a diaphragm having an aperture or apertures corresponding to said intensity distribution.”

However, having “at least one optical element comprises a diaphragm having an aperture or apertures corresponding to said intensity distribution” is known to the art as it is evident by the teaching of Nishi (see fig. 9, where 56 is diaphragm with apertures 58-61). Thus, it would have been obvious to one ordinary skilled in the art at the time the invention was made to further modify the optical element of Inoue et al. as modified by having a diaphragm with variable apertures for at least the purpose to adjust the intensity distribution of the illumination or exposure light.

6. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Orino in view of Inoue et al. and Nishi, as applied to claim 15, and in further view of Onanian (4,568,148).

Orino as modified, discloses all of the claimed limitations except “wherein said polarizer comprises a polarizer mounted in the or each aperture of said diaphragm.”

However, having “said polarizer comprises a polarizer mounted in the or each aperture of said diaphragm” is known to the art as it is evident by the teaching of Onanian (col. 8, lines 1-2, where the polarizing wheels have polarizing arcuate segments). Thus, it would have been obvious to one ordinary skilled in the art at the time the invention was made to further modify the polarizer of Orino as modified by using a polarizing wheel for at least the purpose to obtain an image of a higher resolution.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following discloses an apparatus to produce a rectilinear illumination distribution: Shinoda (US 2002/0001134), Nakashima et al. (RE37,309), Sugita et al. (6,390,754) and Suzuki (US 2001/0010580).

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Gutierrez whose telephone number is (571)-272-5922. The examiner can normally be reached on Monday-Friday: 7:30 a.m. - 4:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Judy Nguyen can be reached on (571)-272-2258. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

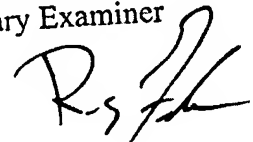
Art Unit: 2851

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Kevin Gutierrez
Examiner
Art Unit 2851

Wednesday, June 21, 2006

Rodney Fuller
Primary Examiner

A handwritten signature in black ink, appearing to read 'R. Fuller', is written over the printed name and title of the Primary Examiner.